Transmission Expansion Planning Using Nonlinear Programming

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Summary

A modified formulation of the transmission expansion planning (TEP) problem is proposed by revising the objective function and operating constraints to include the corona power loss term. Consequently, the objective function includes the cost of investment of transmission lines, the ohmic power loss as well as the corona power loss, which reveals a highly nonlinear objective function. Hence, the nonlinear programming or the non-convex optimization techniques are utilized to solve such large-scale practical problems. The new formulation has been applied to the well-known Garver's 6-bus system. It has been found that for a range of tariffs of kWh, the total cost of the expanded network (when including the corona power loss) is less than that when excluding this new term. Comparison with previously reported work is also included.